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NZQA

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

For Supervisor's use only

Level 1 Mathematics, 2007

90153 Use geometric reasoning to solve problems

Credits: Two
9.30 am Tuesday 20 November 2007

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

You should show ALL working.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–8 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

For Assessor's use only	**Achievement Criteria**	
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Use geometric reasoning to solve problems. ☐	Use, and state, geometric reasons in solving problems. ☐	Solve an extended geometrical problem. ☐
Overall Level of Performance ☐		

You are advised to spend 30 minutes answering the questions in this booklet.

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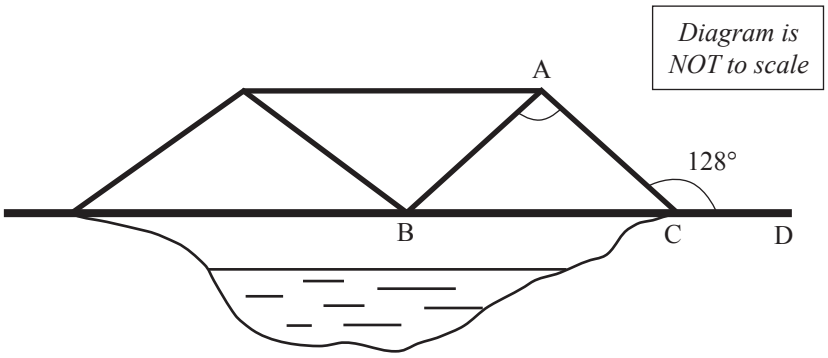
BUILDING BRIDGES

You should show **ALL** working.

QUESTION ONE

A stream runs through Heta's farm.

(a) The diagram shows the side view of one bridge over the stream on Heta's farm.



AB = AC.
Angle ACD = 128°.

Calculate the size of angle BAC.

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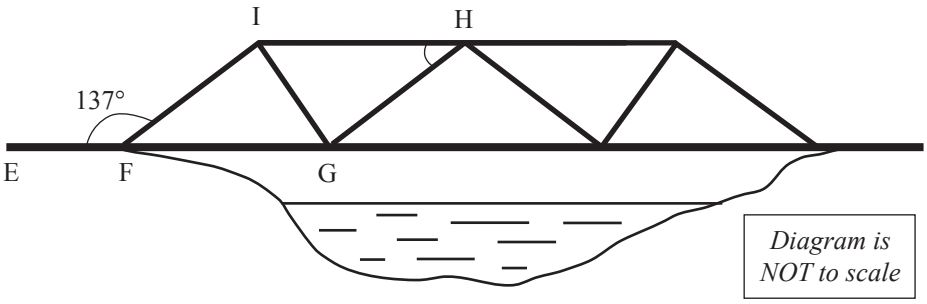
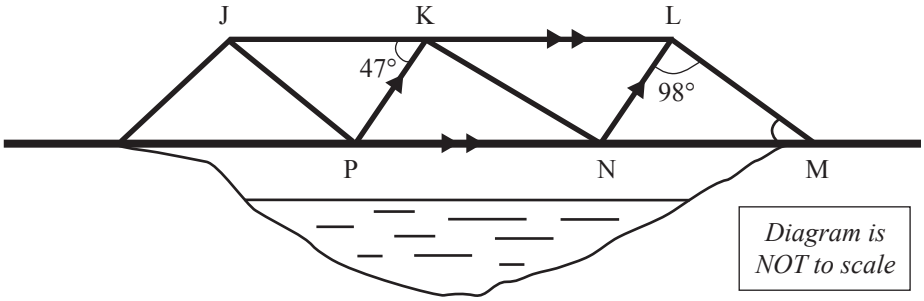
(b) This diagram shows the side view of a second bridge over the stream on Heta's farm.



FGHI is a parallelogram.
Angle EFI = 137°.

Calculate the size of angle GHI.

(c) The diagram below shows the side view of a third bridge over the stream on Heta's farm.



JL is parallel to PM.
PK is parallel to NL.
Angle JKP = 47°.
Angle NLM = 98°.

Calculate the size of angle LMN.

QUESTION TWO

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Heta's grandchildren use sticks and bits of wire to make model bridges.

(a) Tama's model bridge uses a semicircle.
The diagram shows the side view of Tama's model bridge.

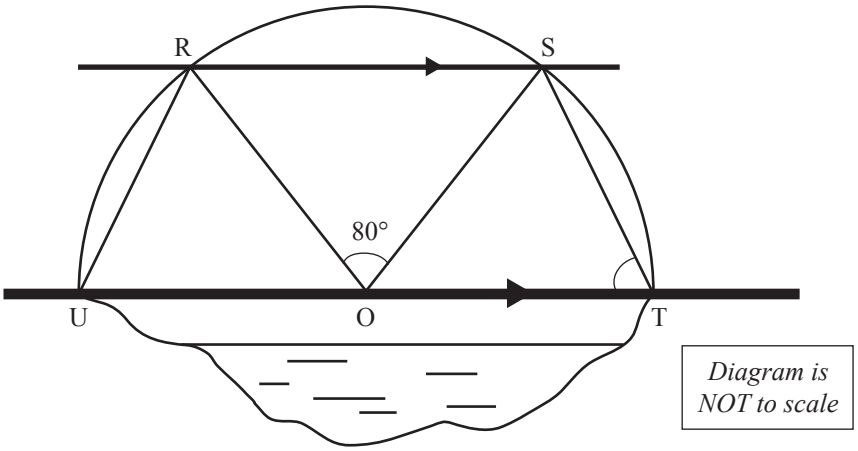

Diagram is NOT to scale

RS is parallel to UT.
UT is the diameter of the circle, centre O.
R and S lie on the circumference of the circle.
Angle ROS = 80°.

Calculate the size of angle STU.
You must give a geometric reason for each step leading to your answer.

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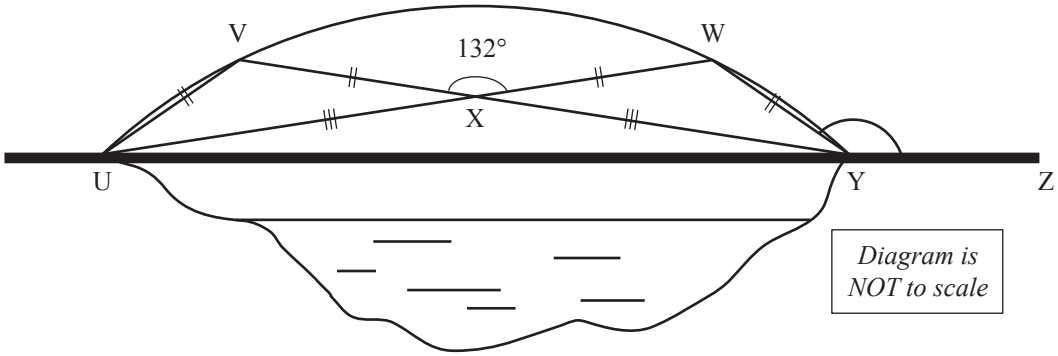
(b) Kim's model bridge uses a circular arc.
The diagram shows the side view of Kim's model bridge.



WX = WY = UV = VX .
UX = XY.
U, V, W and Y lie on the circumference of the circle.
Angle VXW = 132°.

Calculate the size of angle WYZ.
You must give a geometric reason for each step leading to your answer.

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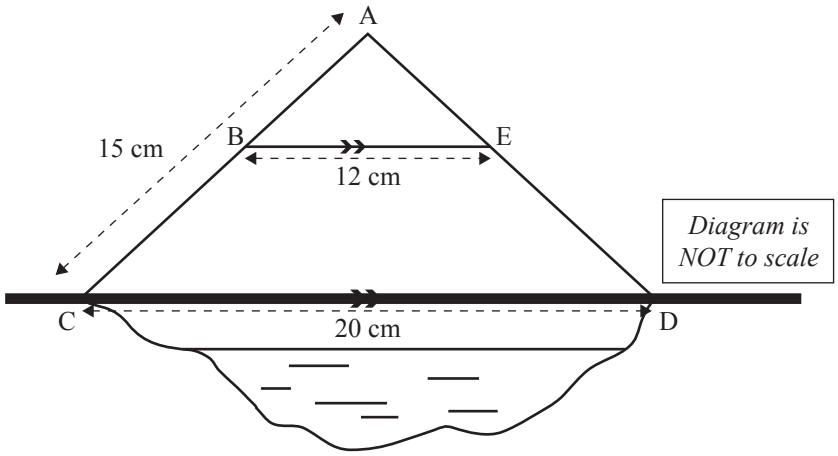
(c) Tony's model bridge uses straight lines.
The diagram shows the side view of Tony's model bridge.



BCDE is an isosceles trapezium with CD parallel to BE.
AC = 15 cm.
BE = 12 cm.
CD = 20 cm.

Calculate the length of DE.
You must give a geometric reason for each step leading to your answer.

QUESTION THREE

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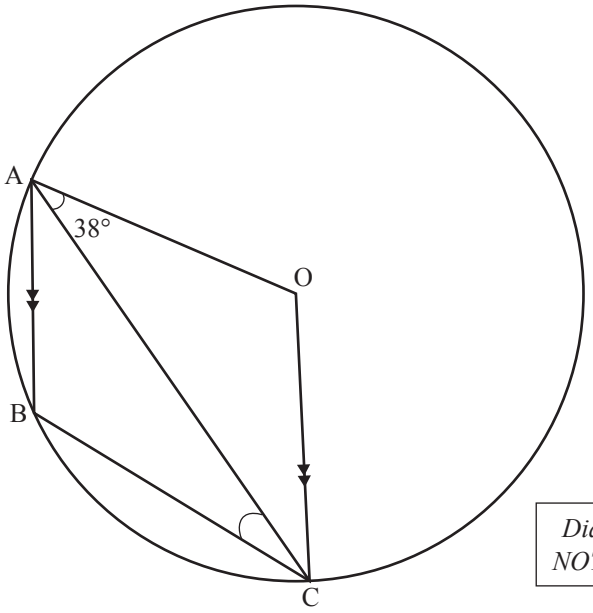

Diagram is NOT to scale

A, B and C are points on the circumference of the circle, centre O.
AB is parallel to OC.
Angle CAO = 38°.

Calculate the size of angle ACB.
You must give a geometric reason for each step leading to your answer.

Extra paper for continuation of answers if required.
Clearly number the question.

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Question number